

## PCT


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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 000711-0024	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/CA 03/00487	International filing date (day/month/year) 03.04.2003	Priority date (day/month/year) 05.04.2002
International Patent Classification (IPC) or both national classification and IPC C08G63/06		
Applicant VALORISATION - RECHERCHE, SOCIETE EN ... Det al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 1 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand  03.11.2003	Date of completion of this report  13.07.2004	
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Zeslawski, W  Telephone No. +49 89 2399-7159	



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/CA 03/00487

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-15 as originally filed

**Claims, Numbers**

1-3, 8 (part), 9-16 as originally filed

4-7, 8 (part) filed with telefax on 01.04.2004

**Drawings, Sheets**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/CA 03/00487

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/CA 03/00487

Reference is made to the following documents:

- D1: WO 03/000766 A (SHASTRI VENKATRAM PRASAD) 3 January 2003 (2003-01-03)
- D2: US-A-5 525 702 (NACE VAUGHN M) 11 June 1996 (1996-06-11)
- D3: US-B-6 221 9771 (CHO KUK YOUNG ET AL) 24 April 2001 (2001-04-24)

**Concerning Point V:**

**Novelty (Art.33(2) PCT)**

Document D2 discloses biodegradable polyglycol-based block copolymers derived from alkylene oxide units and lactone units (claim 1).

Document D3 discloses polylactide grafted with polyethyleneglycolmethylether and a process for preparing the same, which comprises a step of ring opening polymerization, by reacting epoxide-substituted ethyleneglycolmethylether oligomers with cyclic lactone monomers (claim 1).

The subject matter of claims 1-16 of the present application is not disclosed in prior art documents and is regarded as being novel.

**Inventive Step (Art.33(3) PCT)**

Each of documents D2 and D3 can be considered to represent the closest prior art. The subject matter of claim 1 of the present application is distinguished from D2 or D3 by a different substituent  $R_2$  in the general formula (I) of claim 1 of the present application. The technical effect achieved by this distinguishing feature is that the polymer (I) has a functional group, i.e. OH or COOH, and therefore, grafting is facilitated. The objective technical problem to be solved by the present invention may therefore be regarded as the provision of graftable biodegradable polymers derived from cyclic ester or cyclic amide monomers and epoxide monomers.

None of the cited documents discloses or suggests polymers of general formula (I) as useful graftable biodegradable polymers. Consequently, the teaching of the present application provides new compounds of formula (I), which are most suitable for grafting.

Therefore, the subject matter of the present application appears to be not obvious and is regarded as involving an inventive step.

**Miscellaneous**

The back reference to claims 1-5 in claim 6 is incorrect, since Y-group can be an alkyl or phenyl; furthermore X and Y groups can be linked to each other. Consequently, the

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/CA 03/00487

resulting polymers seem to be not covered by the general formula (I) of claim 1 of the present application.

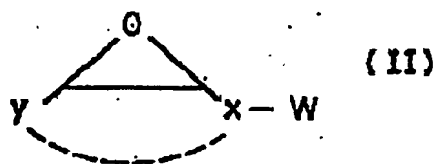
Page 2/5 and the first formula on page 5/5 of drawings seems to be incomplete.

Applicant's attention is drawn to the fact, that D1 will be relevant for novelty assessment in the European regional stage, if any.

4. The functionalizable polymer of formula I as claimed in claim 3, wherein the monomer A is selected from the group consisting of caprolactone, glycolide, dilactide and glycolic lactide.

5. The functionalizable polymer of formula I as claimed in claim 1 or 2, wherein Z is -NH- and the monomer A is selected from the group consisting of lactams and dilactams.

6. The functionalizable polymer of formula I as claimed in any one of claims 1 to 5, wherein the monomer B is selected from the group consisting of the epoxides of formula II:



wherein:

X is a non-functional chain optionally containing one or more heteroatoms but no ester or amide link;

W is -CH<sub>2</sub>CH<sub>2</sub>OH or -CH<sub>2</sub>COOH; and

Y is H, alkyl or phenyl;

X and Y being optionally linked to each other as shown in dotted lines.

7. The functionalizable polymer of formula I as claimed in any one of claims 1 to 5, wherein the monomer B consists of alkyl glycidyl ether.

8. A process for preparing a functionalizable polymer of formula I as defined in any one of claims 1 to 7, comprising the steps of:

a) reacting at least one monomer A as defined in claim 1, 3 or 4 with at least one epoxide of formula III

